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Trends And Projections For The North Carolina Grade A Milk Industry

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PREFACE

This is the first of two reports dealing with the projection of Grade A milk supplies by market areas in North Carolina. A study is underway dealing more specifically with budgetary estimates of production costs and predicted supply responses under alternative milk price situations.

This study was accomplished as a contribution to Southern Regional Project SM-10, Revised "Establishing Guides for Efficient Organization of the Dairy Industry Under Changing Conditions of the South." The overall project is a cooperative effort by the Agricultural Experiment Stations of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, Texas and the Agricultural Marketing Service of the United States Department of Agriculture.

The author gratefully acknowledges the help of the North Carolina Milk Commission in providing access to producer records and in helping to send out the questionaire forms.

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SUMMARY

The total number of Grade A dairy farms in North Carolina increased each year from 1948 until 1954 and decreased every year since that time. Average herd size and total milk production have increased each year since 1948. These trends have differed markedly in the various areas of the state.

In an attempt to explain the differing trends, the state was divided into seven milk-producing areas and the characteristics of the producers in each area were described in some detail. A mail questionaire sent to each producer (and returned by 55 percent of them) provided data on farm size, herd size, management practices and intentions to expand. Average farm size for Grade A milk producers in the sample was 185 acres and average herd size was 39 cows. The milk production regions and their characteristics are as follows:

(1) Northern Mountain Area--The 425 producers in this area average 112 acres per farm and 26 cows per herd, both smaller than the state average. Production per cow and the degree of mechanization also average considerably less than the other regions. Production increases have been rapid in recent years and expressed intentions to expand in the future were much higher than the state average. Dropout rates are relatively low. Future increases in milk production of approximately 7 or 8 percent per year are likely in the next few years if present marketing conditions prevail.

(2) Southern Mountain Area--The 462 producers in this area average 153 acres per farm and 39 cows per herd. Production per cow and the degree of mechanization are about equal to the state average. Production increases in recent years have been stronger than the state average and expressed intentions for future expansion are strong. Increases in future production may average 7 or 8 percent per year with somewhat stronger increases in Henderson, Polk, Transylvania and Clay counties.

(3) Border Counties--In these counties bordering Virginia there are 355 producers, most of whom produce tobacco in addition to milk. Farm size averages 131 acres and herd size averages 31 cows. Production of Grade A milk has increased rapidly in recent years in these counties, particularly Yadkin and Surry counties. Past production increases and expressed intentions to expand indicate strong tendencies to expand in Yadkin, Surry and Stokes counties, with weaker tendencies in the counties farther east.

(4) Southern Coastal Plains--The average farm size of the 194 producers in this area is 165 acres and cow herds average 46 cows. Average production per cow is 17 percent higher than the state average. Production increases around the Wilmington area have been strong, but the outlying counties of Robeson, Cumberland, Sampson, Duplin and Onslow have decreased in total production due to heavy dropouts. Expressed intentions to expand indicate that production will continue to increase in the areas close to Wilmington and decrease in outlying areas.

(5) Southern Piedmont--There are 1,037 producers in this area, making it one of the most concentrated production areas of the state. Average farm size is 187 acres and average herd size is 39 cows. Recent increases in production in Rowan, Iredell, and Stanly counties have been strong but other counties have shown weaker trends. Expressed intentions to expand are weak and production can be expected to level off in this area in future years if present blend prices continue.

(6) Northern Piedmont--Of the 930 dairy farms in this area farm size averages 175 acres and herd size averages 38 cows. Recent production increases have been weak, with decreases occurring in Forsyth and Davidson counties. Expressed intentions to expand are weak and this area may level off or decrease in total production in the next few years at present prices.

(7) Central Coastal Plain--The 133 producers in this area have large diversified farms averaging 244 acres. Cow herds average 50 cows in size. Cotton, tobacco, peanuts, corn, and beans are often produced in conjunction with milk. Production increases have been slow except in the New Bern area and future prospects are for rather stable production on existing farms.

Trends And Projections For The North Carolina Grade A Milk Industry

INTRODUCTION

Few major industries in North Carolina have changed as rapidly since World War II as the Grade A dairy industry. Total Grade A milk production increased fourfold. Average producer size in 1961 was three times as large as in 1948. The future of the dairy industry is clouded by the inconsistencies in the magnitude--and in some cases, the direction--of some of these trends. For example, the number of producers doubled between 1948 and 1954, and then decreased by 25 percent from 1954 to 1961.

These changes did not "just happen." The characteristics of the industry today are the net results of production decisions by thousands of individual producers, each acting on his own initiative with his own individual resources and limitations.

The structure of the industry today will provide the framework within which future changes will occur. Consequently, a detailed look at the characteristics of present Grade A producers should enable better predictions to be made about future numbers of producers, producer characteristics, milk supplies and prices.

Purpose of Study

The purposes of this study are:

(1) To describe some of the changes which have occurred in the dairy industry since 1948 and point out wherever possible the major factors contributing to such changes.

(2) To describe in detail some of the characteristics of present Grade A producers which, it is thought, influence their economic decisions.

(3) To indicate some of the important differences in the characteristics of producers in various regions within the state.

(4) To project number of producers, size of producers and milk supplies to future time periods.

Data Sources

Data sources are as follows:

(1) Data on statewide trends in number and average size of producers, total milk production, and blend prices were taken from the Dairy Report, published by the North Carolina Milk Commission.

(2) Data on number and size of individual producers by North Carolina counties were obtained from North Carolina Milk Commission individual base record cards. A complete enumeration of producers was accomplished from this data.

(3) Data on type of equipment used on individual farms, farm organization, herd characteristics, etc., were obtained in a mail survey form sent to all producers. Final estimates for this type of information were made on the basis of a 54 percent return. A copy of the questionaire is contained in the Appendix.

(4) Information on the current activities of producers who recently discontinued Grade A milk production was obtained from a mail survey form sent to county agents. In practically all cases, the county agents could identify former Grade A producers and indicate what they are now doing.

GENERAL TRENDS IN THE MILK INDUSTRY, 1948 - 1962

Some of the major trends in factors associated with the Grade A industry are given in Table 1. The period of 1948-1954 was characterized by rapid entry of Grade A producers, slight increases in producer size, and rapid increases in Grade A sales to distributors. During this period the number of producers more than doubled, average producer size increased 27 percent and total Grade A sales increased by 160 percent. During this period, North Carolina became self-sufficient in fluid milk needs; imports of milk decreased from 25 percent of total requirements in 1946 to less than 3 percent in 1954.

Table 1. Recent trends in the supply of Grade A milk in North Carolina[a]

Year	Number of Grade A producers[b]	Average daily production per producer (lbs.)[c]	Grade A purchases from producers by N. C. distributors (million lbs.)	State average blend price
(1)	(2)	(3)	(4)	(5)
1948	2,544	276	256	d
1949	3,387	275	340	d
1950	4,053	289	427	d
1951	4,368	304	485	d
1952	4,664	307	523	6.06
1953	4,742	354	613	6.00
1954	5,182	352	665	5.73
1955	5,167	365	689	5.86
1956	4,974	418	759	5.89
1957	4,805	477	837	5.80
1958	4,674	490	836	6.05
1959	4,430	557	901	6.04
1960	4,205	625	960	5.98
1961	3,984	694	1,038	5.80
1962	3,850	771	1,080	5.79

[a]Source: North Carolina Milk Commission, Dairy Report, various issues.

[b]Figures pertain to January of each year.

[c]Column (4) divided by Column (2) and divided by 365 days.

[d]Not reported.

The reasons for the rapid expansion in Grade A milk production during this period are many and varied. After the imposition of uniform statewide quality restrictions in 1947, manufacturing grade milk could no longer be used for fluid purposes. Since the price of Grade A milk was considerably above that of manufacturing milk, there was considerable incentive for manufacturing milk producers to shift over to Grade A production in order to qualify for the fluid market.

During the period 1954-1959 different economic forces came into focus. The number of Grade A dairy producers decreased 15 percent. However, average production per farm increased by 35 percent. The decrease in number of producers was caused in large part by increased mechanization in milk production which required substantial investment in equipment--bulk tanks, for example. Rather than make the large investments required, many producers switched to other

enterprises. Those who remained in production and invested in new equipment increased herd size in order to justify the capital expenditure. According to survey figures, average herd size increased by 42 percent during this period. Average production per cow also increased sharply. Thus, total production increased considerably during this period despite decreased numbers of producers. This trend was typical throughout much of the United States.

The transition to bulk tanks was largely completed by 1959 and thus does not explain dropouts after 1959. Producer dropouts after 1959 are due in part to lower blend prices and the increasing availability of nonfarm jobs. Also, the possible decreasing availability of labor and high beef prices may have caused some producers to sell their herds and shift to beef cattle production. In some areas local market instability has contributed to high rates of dropout.

The trend in numbers of producers shown in Table 1, Column 2, reflects the net effects of producer dropouts and entry of new producers. The actual dropout rate from 1955 to the present was larger than indicated in the table. For example, during the period of 1959 to 1961 the actual dropout of producers numbered more than 600. However, the entry of some 250 new producers held the net decrease of producer numbers during this period to 446.

A survey form sent to county agents gave some information about the present activities of farmers who discontinued Grade A production between 1959 and 1961. Approximately one-third of the producers had retired, one-third had obtained nonfarm jobs and one-third had begun or continued other enterprises, including in some cases, Grade C milk.

The rate of dropouts was much higher for small producers than for large producers. Between 1959 and 1961 about 37.5 percent of the producers delivering less than 5,000 pounds per month (equivalent to approximately 10 cows) discontinued production. Only 11.2 percent of the producers delivering more than 50,000 pounds per month (equivalent to approximately 40 or more cows) discontinued production during this same period. Since the dropout rates in the larger size categories are so low, it is conceivable that most of the dropouts were caused by retirements and father-to-son transfers.

The continued increase in average daily production per producer displayed in Column 2 of Table 1 is a function of increasing herd sizes and increasing production per cow. Survey data indicate that the number of cows on Grade A dairy farms increased 12.6 percent from the summer of 1956 to the spring of 1962. Total milk production increased 42 percent. The increase in production per cow during the period was approximately 30 percent or 5 percent per year.

The decreasing number of producers and increasing number of cows resulted in an increase in average herd size of 42 percent during this period.

The remarkable increase in production, illustrated in Table 1, Column 4, was not matched with similar increases in fluid sales. Much of the increased production went into manufacturing uses at reduced prices. Blend prices remained reasonably stable because of higher government butterfat supports, which raised the Class III price, and higher administered Class I and Class II prices. However, there appeared to be a significant weakening in the blend price in 1961 and 1962.

GENERAL CHARACTERISTICS OF GRADE A PRODUCERS, 1961-1962

In the spring of 1962, the "average" Grade A producer in North Carolina was 46.2 years old, had 36.6 mature cows, was presently milking 29 cows with a bucket-type milker, obtained approximately 8,200 pounds of milk per cow per year, raised most or all of his replacements, grew most or all of his silage, half of his hay and bought most or all of his feed grain. He estimated that with his present facilities he could handle a maximum of 36 percent more cows and expected to have 24 percent more by 1964.

The size distribution of producers in the state as of April, 1962, is given in Table 2. North Carolina producers average much smaller than producers in other states. Average herd sizes in Virginia in 1958 were 40 cows presently being milked.1/

Table 2. Size distribution of producers, spring, 1962[a]

Number of cows	Percent in each class	Cumulative percentage
0-19	16.2	16.2
20-29	29.1	45.3
30-49	35.9	81.2
50-74	13.6	94.8
75-99	3.0	97.8
Over 100	2.2	100.0

[a]Source: Mail questionaires mailed to all Grade A producers in the spring of 1962.

1/ The Grade A Dairy Industry in Virginia, Virginia Agricultural Experiment Station Joint Agricultural Publication No. 2, Blacksburg, Virginia, June, 1959.

Type of Equipment

According to the questionaire mailed to producers, pipeline milkers are used on 36.5 percent of the farms, 62.3 percent of the farms have bucket type milkers and the remaining 1.2 percent milk by hand. As one might expect, the smaller farms have proportionately fewer pipeline milkers. Only 10 percent of the farms with less than 20 cows and 24 percent of the producers with 20-30 cows operate pipeline milkers.

Feeding systems are still largely unmechanized. Only 4.2 percent of the farms reported fully mechanized feeding systems, 23.7 percent reported partially mechanized feeding systems, and the remaining 72.1 percent fed by hand. Herds were composed of 71.1 percent Holstein, 14.8 percent Guernsey, 9.6 percent Jersey and 4.5 percent other breeds.

Other Income Sources

Twelve percent of the operators have part-time jobs off the farm. These were scattered rather uniformly over the state. Average herd sizes of part-time job holders were approximately equal to the state average, indicating that many producers hired the work done while they held nonfarm jobs. Forty-six percent of the dairies were specialized while 54 percent had income from commodities other than milk or dairy livestock. The proportion of specialized dairies varies substantially among the various regions of the state, as will be seen in a later section.

Size of Farm

The average Grade A producer operated a farm with 105 acres of cropland and 60 acres of pasture. Farms were considerably smaller than average in the mountain areas and larger than average in the coastal areas. More specific data on the size of farms in different areas of the state are included in a later section of this report.

Labor Requirements

The questionaires returned by "specialized" Grade A producers (those producing no other commodity) were analyzed to determine normal labor requirements for herd care. It appeared that many herds of 40 cows and larger were being operated by one full-time man. In many cases such herds were handled without mechanized feeding systems or pipeline milkers. One dairy reported a 57-cow herd handled by a single full-time man using a 4-cow milking parlor, hand feeding system and bucket type milker. The largest herd handled by two full-time men was 86 cows. The 86-cow herd

was handled with a pipeline milker, 6-cow milking parlor and partially mechanized feeding system. Several other two-man herds numbering more than 80 cows were being handled with similar equipment. The largest 3-man specialized dairy herd was a 145-cow herd, fully mechanized feeding system, pipeline milker and a 16-cow milking parlor. Most of the other large 3-man dairies were in the 80- to 90-cow herd class. There was one 4-man dairy with a 170-cow herd, hand feeding system, pipeline milker and 6-cow milking parlor. However, most 4-man dairies were in the 80- to 90-cow herd class. The larger 5- and 6-man dairies were in the 100- to 150-cow herd classes--most of them with mechanized feeding systems and pipeline milkers. Many 5- and 6-man specialized dairies handled only 50-100 cows, of course, but these dairies would probably not be considered efficient. The questionaire did not attempt to ascertain the quantities of part-time labor employed. It is probable that many of these farms hired part-time labor to harvest forage and possibly help with the daily milking operation.

There are not sufficient data in this section to specify "standards" of labor requirements, but it does appear that the number of cows which can be handled per full-time man is approximately 40-45 cows. However, this number appears to diminish as the size of herd approaches 100 cows. There would seem to be no obvious reason why this is so, unless management problems become more complex with larger farms.

No such analysis was made for diversified farms since there is no valid method for allocating labor among the various enterprises.

Size Changes of Individual Producers

Future production will depend on the rate of growth of individual producers and the dropout and entry rates. The 1959-1961 trends in these variables are analyzed in this section.

Data were available on the September deliveries of 3,947 individual producers in 1959 and 1961. By comparing the 1961 September deliveries with the 1959 deliveries for each individual producer, it was possible to observe their rates of growth during this period.1/ These data are summarized in Table 3, which shows the proportions of producers moving between various arbitrary size categories during this

1/ Since the base making period for very few producers changed during this period, it is believed that the September deliveries in 1961 relative to the same month in 1959 reflect reasonably accurately the change in producer size.

period. The figure in the third box of row two (labeled 1-4,999) means that 35.6 percent of all dairies who were in the 1-4,999 pound class in 1959 had expanded into the 5,000-9,999 pound class by 1961. Reading in the same row, we find that 33.9 percent discontinued production, 19.0 percent remained in the same size category, 5.7 percent expanded into the 10,000 to 14,999 pound size category, etc. The percentages in that row and all rows add to 100.0. Entries to the right of the main diagonal represent increases in size, and entries to the left of the diagonal represent decreases in size.1/ The table indicates that decreases in size are uncommon (except to go out of business) and that very rapid growth also is uncommon. Producers tend toward gradual increases in size--possibly because of capital limitation. By summing the entries to the right of the diagonal and comparing the total with the total of the entries to the left, a rough estimate of the average tendency to expand size can be obtained.2/ The sum of the numbers on the right side of the diagonal in this case happens to be 1.05 times as large as the sum of the numbers on the left, indicating that there has been a slight net tendency for producers to expand size during this period. There are no "standards" with which to compare this figure. However, in a later section this type of analysis is completed for several market areas in North Carolina and a comparison is made between the areas. The results become more meaningful when different areas are compared.

The coefficient of expansion is not a good indicator of possible future total production because no consideration was given to the actual number of producers in each category. In a later section of this report the number of producers in each size category is considered in conjunction with the coefficients of expansion to provide projections of future production.

1/ It will be noted that the size categories in Table 3 are not completely uniform with respect to range in volume. Hence it cannot be concluded that producers in the 25,000-49,999 pound size category tend to expand less than producers in the 15,000-24,999 pound category merely because a higher proportion of the former remained in their original size category.

2/ Hereafter called the "coefficient of expansion." An alternative method of defining the coefficient of expansion would be to put "number of producers" in each of the cells of the table rather than "percentage of producers." However, due to the rather even distribution of producers among size groups, the estimate of the coefficient of expansion would not have been appreciably changed.

Table 3. Size changes of individual producers from 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		99.7	0	0	0.1	0.1	0.1	0
1 - 4,999	174	33.9	19.0	35.6	5.7	4.6	0.6	0.6
5,000 - 9,999	742	20.1	4.6	38.8	25.9	9.5	1.1	1.0
10,000 - 14,999	900	13.7	0.9	10.1	38.0	33.0	4.3	0
15,000 - 24,999	1069	12.1	0	1.8	11.4	49.8	24.6	0.3
25,000 - 49,999	620	10.7	0	0.3	1.3	10.2	63.5	14.0
Over 50,000	141	10.6	0	0	0	0	11.3	78.0

PRODUCTION DATA AND TRENDS BY COUNTIES

Considerable data were available on trends by counties. Since these trends differed substantially between areas of the state, it was considered desirable in this section to summarize these trends by individual counties.

Table 4 lists the number of producers, the total deliveries and the average delivery per producer by counties in September, 1961. Some counties with negligible production are omitted. The counties are listed in order of largest total production. Figure 1 is a scatter diagram illustrating the geographical distribution of milk production. The Piedmont is obviously the area in which production is most concentrated. The Piedmont has been a very important milk producing area for some time. The concentration of the population and the relatively high cost of transporting milk from outlying areas have been important factors in the development of the dairy industry of the Piedmont.

The areas of the state in which milk production increased fastest from 1959 to 1961 are shown in Figure 2. The mountain and foothill areas have increased particularly fast during this time. Most areas of the Piedmont are increasing more slowly, with Forsyth and Davidson counties showing decreases. Milk production is also increasing rapidly in the Wilmington and New Bern milksheds and in the Raleigh-Durham area.

The number of Grade A producers has been decreasing in most counties. Exceptions to this general trend are several of the mountain counties and a few counties in the coastal plains area. The Piedmont, in which production is heavily concentrated, has had particularly heavy decreases. Figure 3 shows the trend in producer numbers by counties.

One of the survey questions asked each producer during the spring of 1962 was the number of cows expected in 1964. These expectations were compared with present herd sizes by counties and percentage changes in average herd size were calculated. While some individual producers indicated they intend to decrease their herd size, by far the largest proportion of producers expressed intentions to expand herd size. The statewide average expected percent increase in herd size was 24 percent. Figure 4 indicates areas with (1) higher than average and (2) lower than average expected increases in herd size. Expected increases in herd size are heavy in the foothill areas and in the New Bern and Wilmington areas.

If any conclusions can be drawn from the foregoing discussion of the 1959-1961 trends in total production, producer numbers and intentions to expand, they must be the following:

(1) There appears to be considerable pressure for the foothill areas to expand in production. These tendencies appear even stronger in the New Bern and Wilmington milksheds. Producer numbers in these areas are steady or increasing, production increases in recent years have been strong and intentions to expand are strong.

(2) The very concentrated production areas of the Piedmont are showing signs of leveling off production and some counties are exhibiting recent decreases. This is particularly true of Forsyth and Davidson counties.

DIFFERENCES IN CHARACTERISTICS OF PRODUCERS AMONG REGIONS

The state was divided into "production areas" (groups of counties) of reasonably homogeneous production characteristics. The major criteria for classification were farm size, types of supplementary enterprises, geographical locations and topography. Although such a classification is somewhat arbitrary, it is possible to detect considerable differences in the characteristics of milk producers in various areas of the state. The market areas set up are illustrated in Figure 5. A description of each of the market areas follows. It is hoped that an investigation of the characteristics of the sample producers and their farms and equipment will provide some basis for appraising the meaning of the trends discussed in the preceding section.

AREA I - NORTHERN MOUNTAIN AREA

Producer Characteristics

There are 425 producers in this area,1/ of which about 40 percent are specialized dairies.2/ The other 60 percent produce tobacco and, in some cases, other livestock enterprises. Farm sizes average 52 acres of cropland and 60 acres of pasture. Herd sizes are generally small, averaging 26 cows,

1/ This estimate was derived by grouping estimates of producer numbers for individual counties in Table 4.

2/ This estimate and other estimates of producer characteristics for this and following areas are based on the mail questionaire returned by 54 percent of the producers.

Table 4. Production of Grade A milk by counties, September, 1961, in order of largest production[a,b]

County	Number of producers	Volume (pounds)	Average prod. per farm (pounds)
Iredell	213	4,319,054	20,277
Rowan	155	3,258,611	21,023
Randolph	131	3,147,054	24,023
Buncombe	137	3,116,245	22,746
Alamance	128	2,975,760	23,248
Davie	129	2,693,113	20,877
Wake	69	2,662,771	38,591
Henderson	86	2,653,261	30,852
Guilford	107	2,623,441	24,518
Mecklenburg	97	2,397,826	24,720
Cleveland	94	2,340,354	24,897
Orange	77	2,215,241	28,769
Chatham	86	2,101,979	24,442
Lincoln	111	2,051,259	18,480
Union	90	2,017,063	22,412
Yadkin	107	1,752,758	16,381
Stanly	59	1,750,925	29,677
Alleghany	83	1,721,723	20,744
Catawba	78	1,718,532	22,032
Forsyth	97	1,636,323	16,869
Cabarrus	64	1,448,131	22,627
Davidson	71	1,407,969	19,831
Gaston	63	1,390,284	25,667
Granville	50	1,255,252	25,105
Alexander	84	1,222,378	14,552
Haywood	49	1,193,730	24,362
Rockingham	58	1,066,981	18,396
Macon	38	954,422	25,116
Surry	44	930,201	21,141
Cumberland	29	915,958	31,585
Warren	25	721,220	28,849
Wayne	37	691,047	18,677
Madison	37	673,797	18,211
Pender	32	651,461	20,358
Yancey	46	645,922	14,042
Caldwell	39	623,077	15,976
Rutherford	39	620,132	15,901
Bladen	17	615,130	36,184
Caswell	22	571,678	25,985
Columbus	23	564,186	24,530
Craven	20	562,942	28,147
Durham	20	539,223	26,961
Clay	35	534,361	15,267
Lenoir	10	527,377	52,738
Pitt	16	490,505	30,657
Anson	26	480,626	18,486
Robeson	18	449,148	24,953

Table 4 (continued)

County	Number of producers	Volume (pounds)	Average prod. per farm (pounds)
Halifax	13	442,907	34,070
Wilkes	25	433,849	17,354
Ashe	28	427,298	15,261
Sampson	16	391,764	24,485
Beaufort	16	389,369	24,336
Edgecombe	15	385,007	25,667
Person	18	374,604	20,811
Carteret	1	370,610	370,610
Burke	24	360,294	15,012
Montgomery	13	314,474	24,190
McDowell	19	299,652	15,771
Johnston	15	297,683	19,846
Mitchell	18	290,213	16,123
Watauga	18	267,862	14,881
Nash	5	260,628	52,126
Transylvania	15	244,362	16,291
Polk	11	236,542	21,504
Duplin	10	225,318	22,532
Scotland	7	222,171	31,739
Pamlico	7	214,099	30,586
Harnett	9	210,744	23,416
Brunswick	7	200,333	28,619
Cherokee	15	199,610	13,307
Northampton	6	182,847	30,474
Washington	3	179,188	59,729
Stokes	15	173,766	11,584
Hyde	9	164,742	18,305
Onslow	5	162,833	32,567
Wilson	4	152,661	38,165
Vance	12	148,288	12,357
Bertie	2	110,390	55,195
Martin	4	106,051	26,513
Greene	2	79,970	39,985
Lee	5	77,632	15,526
Swain	5	76,955	15,391
Moore	5	61,196	12,239
Hoke	2	57,367	28,684
New Hanover	3	56,015	18,672
Avery	4	55,930	13,982
Jones	3	55,700	18,567
Franklin	4	54,668	13,667
Graham	3	30,355	10,118
Tyrrell	1	20,333	20,333
Jackson	2	17,366	8,683
State total	3,570	79,984,077	2,499,155

[a]Source: Milk Commission base record cards for individual producers.

[b]Producers were allocated to counties according to their mailing address. Producers located close to county boundaries may be located in a different county than their mailing address would indicate. Hence, some error may be present in these figures. It is believed, however, that the individual county totals are in most cases approximately correct due to cancellation of errors.

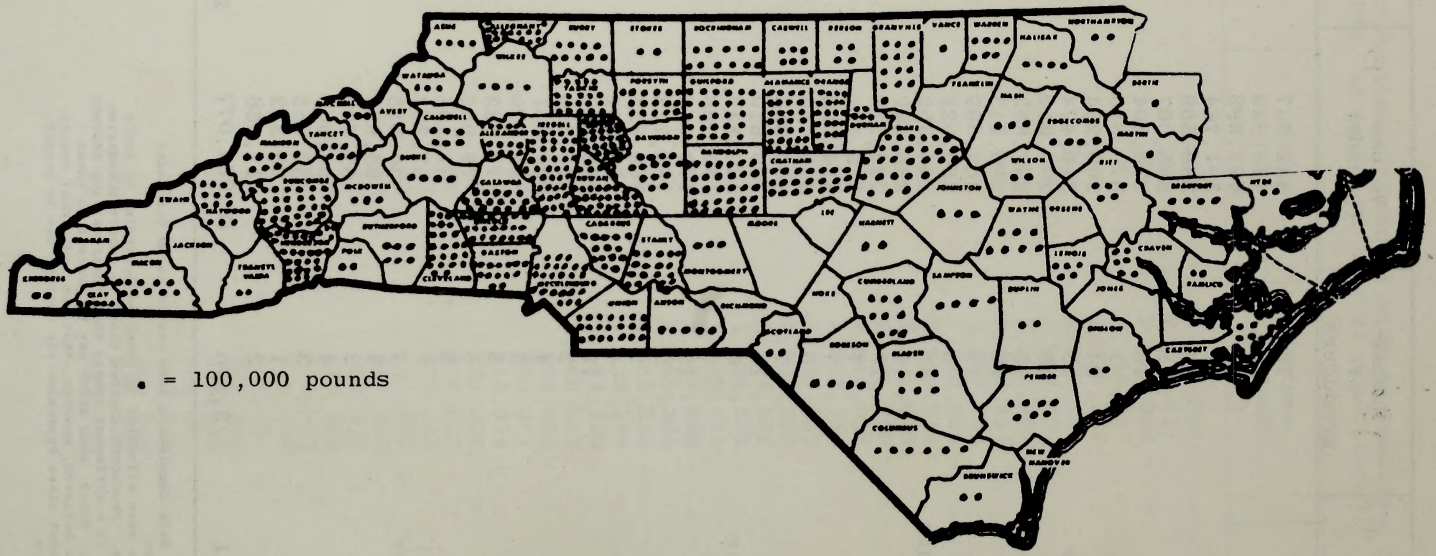

Figure 1. Production of Grade A milk by counties, September, 1961

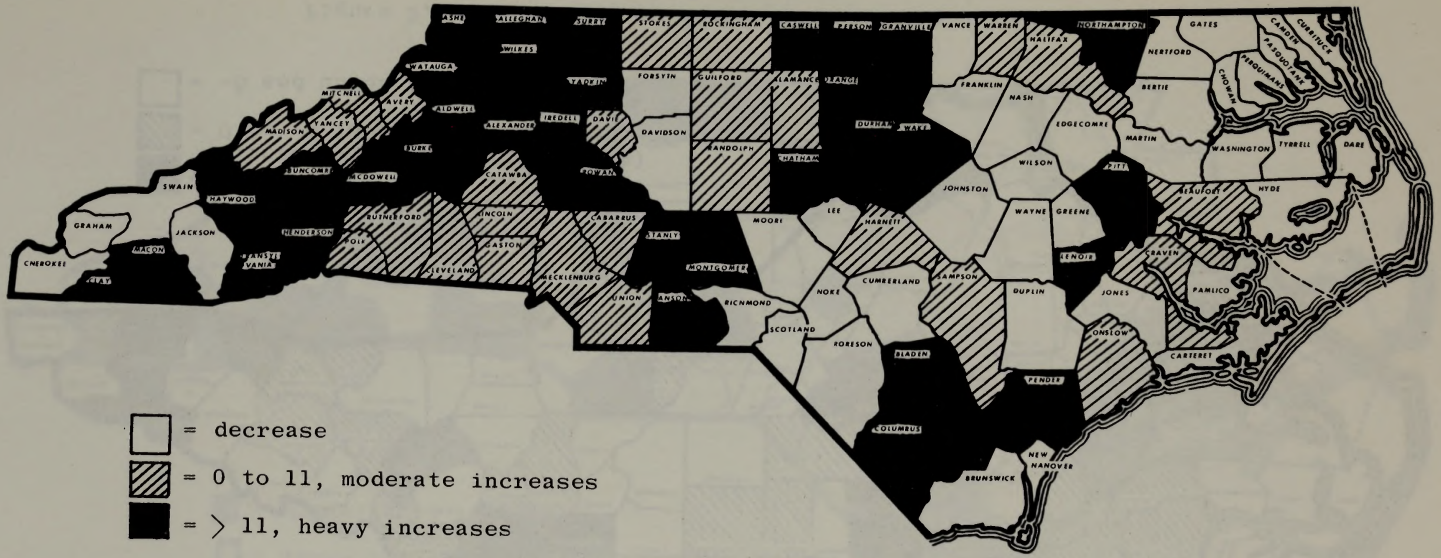

Figure 2. Percentage changes in Grade A milk production, 1959 to 1961

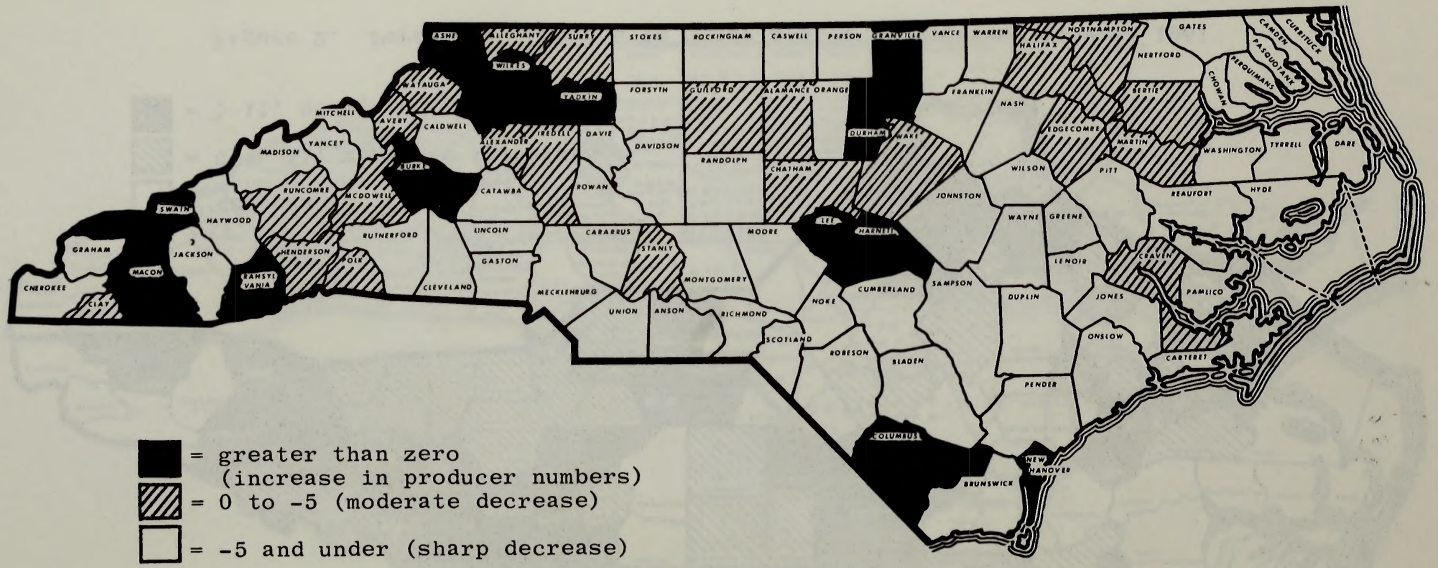

Figure 3. Net changes in number of Grade A producers

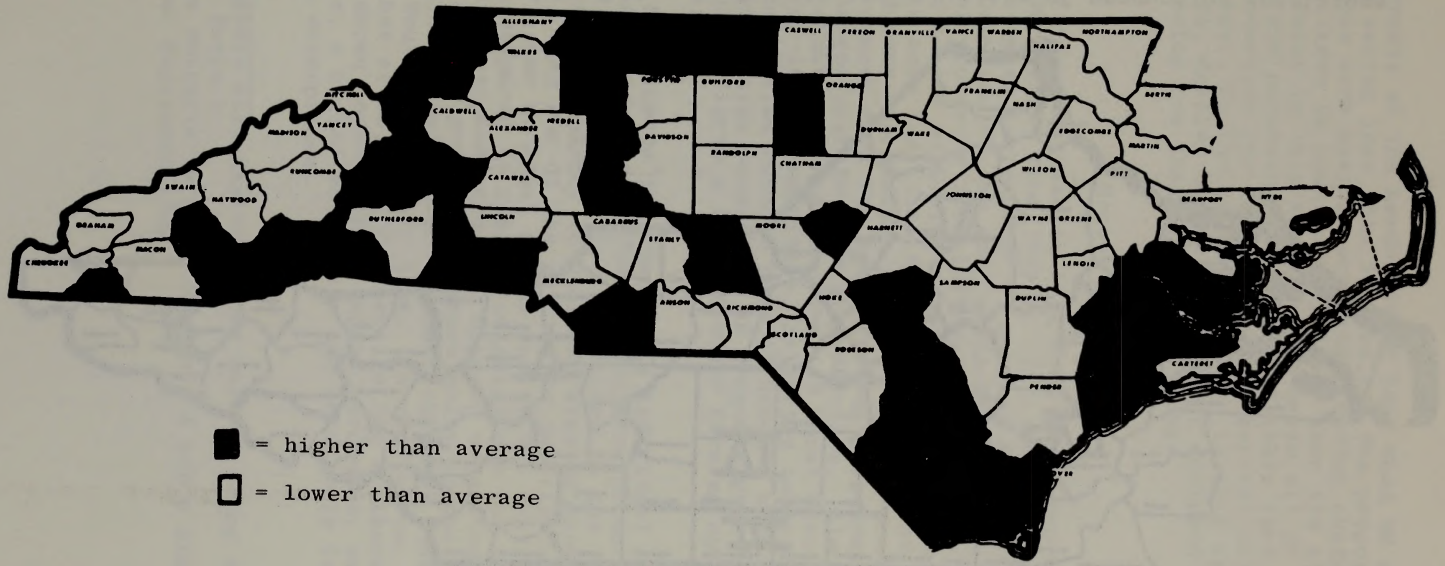

Figure 4. Intentions to expand size of herd

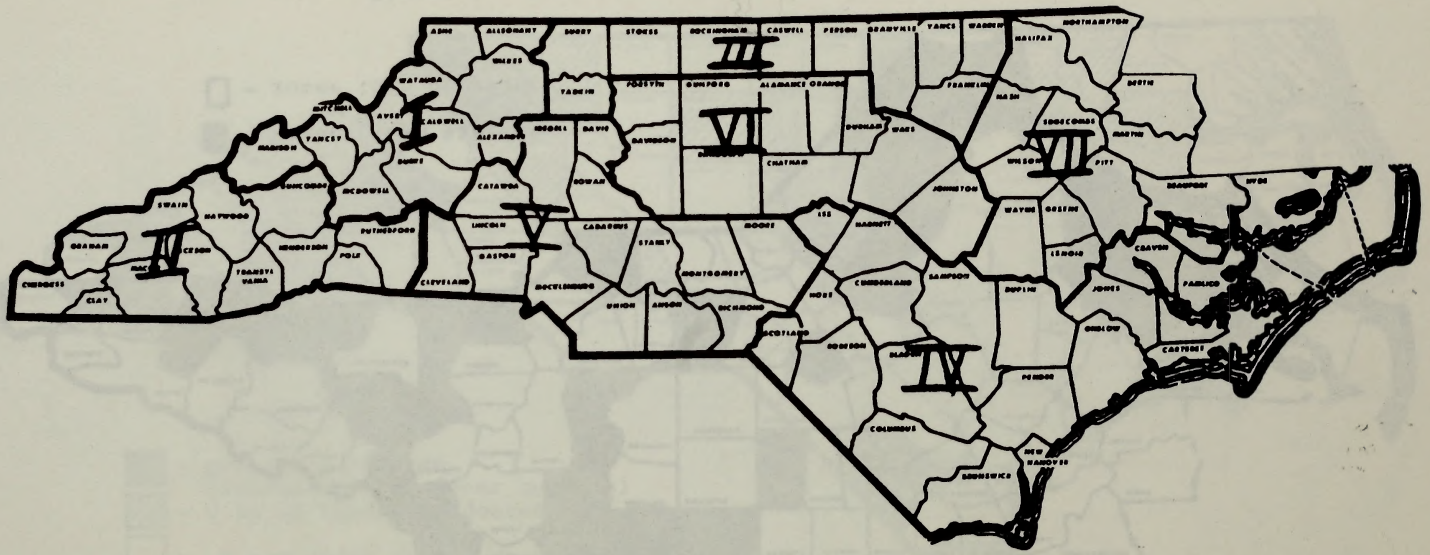

Figure 5. The market areas delineated according to the variation of production conditions

with 30 percent of the herds having less than 20 cows and 70 percent having less than 30 cows.1/ The proportion of farms in this area having mechanized feeding systems and pipeline milkers is considerably lower than the statewide average. Farms in this area tend to raise all of their hay and silage and purchase most or all of their feed grain. Average production per cow is about 15 percent below the state average. So the average producer in this area has a smaller farm, smaller herd, is less well equipped and has a lower producing cow than the state average.

Recent Trends

Production increases in this area have been strong, averaging 20 percent from 1959 to 1961, as compared to the average statewide increase of 11 percent.2/ Most of this expansion occurred in the smaller herds. The net decrease in number of producers from 1959 to 1961 was only 1.6 percent, as compared to the statewide average of 7.8 percent. Original dropouts were less than the state average and the entrance of new producers was strong. Many of the new producers had formerly produced milk for manufacturing purposes and had recently changed over to Grade A production. Almost half of the dropouts obtained nonfarm jobs and about one-fourth are now producing other commodities, primarily tobacco and beef. A few of the dairies changed over to Grade C milk production. The relatively large proportion of dropouts getting nonfarm jobs possibly reflects a lack of other farming opportunities in the area.

Table 5 indicates the changes in individual producer sizes by size categories. The tendency for producers to expand herd sizes is shown by the entries to the right of the diagonal and the tendency to decrease size is shown by entries to the left. The sum of the entries to the right of the diagonal is 1.7 times as great as the sum of the entries to the left. When compared to similar calculations for other areas, the tendency to expand herd size appears very strong. The proportion of 1959 producers discontinuing production by 1961 was 12.6 percent, which is lower than any other area except the Southern Mountain area. In conclusion, when compared to other areas, the producers in the Northern Mountain areas have shown tendencies to expand herd size, had a lower dropout rate, a higher entry rate and relatively few alternative farm enterprises.

1/ Complete size distributions for all areas are contained in Appendix Table 1.

2/ This estimate is based on Table 4 and a similar table developed for September 1959.

Table 5. Size changes of individual producers, Northern Mountain area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		99.1	0	0.2	0.2	0.3	0.2	0
1 - 4,999	28	14.3	14.3	53.6	7.1	10.7	0	0
5,000 - 9,999	114	15.8	1.8	37.7	31.6	12.3	0.9	0
10,000 - 14,999	100	10.0	0	12.0	52.0	25.0	1.0	0
15,000 - 24,999	100	11.0	0	1.0	12.0	51.0	25.0	0
25,000 - 49,999	23	13.0	0	0	0	13.0	69.7	4.3
Over 50,000	1	0	0	0	0	0	0	100.0

Future Production Prospects

Producers in this area expressed intentions to expand herd size by an average of 27 percent by 1964, which is somewhat higher than the statewide average. In view of this intended expansion, recent strong increases in production and the present characteristics of the producers, it appears that this area will probably continue to increase in production somewhat faster than the rest of the state for several years if present prices prevail. The smaller producers can be expected to increase the sizes of their herds in order to utilize labor and other resources more efficiently. The lack of good production alternatives to replace dairying may continue to slow down the dropout rate. Also, the production per cow, being at lower than average levels, may increase faster than the statewide average.

AREA II - SOUTHERN MOUNTAINS

Producer Characteristics

The 462 producers located in this area have farms averaging 81 acres of cropland, 72 acres of pasture and 39 cow herds. The area is reasonably homogeneous with respect to farm size, except for Henderson County, which has farms averaging 177 acres of cropland and 58 cow herds. About 60 percent of the farms are specialized dairies. The remaining 40 percent raise tobacco (primarily in Haywood and Buncombe counties) and other livestock (in the remaining counties). The proportion of farms in this area having mechanized feeding systems and pipeline milkers is about equal to the state average. Average production per cow is about 5 percent below the state average. Approximately 14.2 percent of the herds had less than 20 cows and 46.7 percent had less than 30 cows. Producers buy most or all of their feed grain but raise most or all of their hay and silage.

Recent Trends

Production increases during 1959-1961 averaged 15 percent, which is slightly larger than the statewide average. Henderson, Transylvania and Macon counties exhibited very strong increases. The net decrease in producer numbers was 3.2 percent from 1959 to 1961. The rate of dropouts was about equal to the state average, but the entrance of new producers nearly offset the decrease in old producers. The entrance of new producers was particularly important in Buncombe, Henderson, Clay and Macon counties. Very few of the dropouts in this area went into nonfarm jobs. Many of them changed over to beef enterprises. The tendency to increase size of herd is stronger in this area than any other

(see Table 6). The sum to the right of the diagonal is twice the sum to the left. Also, the 1959-1961 dropout rate was only 8.6 percent, the smallest of any other area. The tendency for new entry of producers is also strong, as can be seen by reading across the first row. Most of the new producers enter at the 15,000-24,999 pound size class.

Future Production Prospects

The expansion plans of producers in this area averaged an increase in herd sizes of 26 percent, slightly higher than the state average. Expansion plans were particularly strong in Henderson, Polk, Transylvania and Clay counties, averaging 37 percent in these counties. Based on producer intentions and the indicated strength of the forces causing expansion of herd, relative to contraction, the outlook is for continued expansion at a rate considerably greater than most other areas.

AREA III - BORDER COUNTIES

Producer Characteristics

Eighty-five percent of the 355 producers in this area produce tobacco (and only tobacco) in addition to the dairy enterprise. Milk producers in this area are fairly homogeneous in size of farm (87 acres of cropland and 47 acres of pasture, on the average) and size of herd (31 cows, on the average). Both size of farm and size of herd are smaller than the state average. Approximately 24.6 percent of the farms have herds of less than 20 cows and 52.8 percent have herds with less than 30 cows. The proportion of farms having mechanized feeding systems and pipeline milkers is about equal to the state average. Average production per cow is about equal to the state average.

Recent Trends

Production increases during the period 1959-1961 were 23.3 percent, more than twice as high as the state average. Production increases were particularly strong in Yadkin County (37.9 percent), Person County (33.9 percent) and Granville County (32 percent). The net decrease in the number of producers in this area during the period 1959-1961 averaged only 4.0 percent. The 4.9 percent increase in producer numbers in Yadkin County substantially affected the average for the area. Stokes and Rockingham counties exhibited decreases in producer numbers of 25.0 and 13.4 percent, respectively. Actual dropouts were about equal to the state average, but new producers in Yadkin and Surry counties kept the net decrease in number of producers small.

Table 6. Size changes of individual producers, Southern Mountain area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		98.7	0	0.2	0.2	0.8	0.1	0
1 - 4,999	10	20.0	30.0	30.0	10.0	10.0	0	0
5,000 - 9,999	114	13.2	7.9	31.6	28.0	16.7	2.6	0
10,000 - 14,999	130	10.8	0.8	10.8	32.3	40.7	4.6	0
15,000 - 24,999	128	4.7	0	2.3	8.6	57.8	25.0	1.6
25,000 - 49,999	93	4.3	0	0	1.1	10.7	64.5	19.4
Over 50,000	24	8.3	0	0	0	0	8.3	83.4

Dropouts tended to remain in tobacco production rather than seeking full-time nonfarm jobs. Table 7 indicates that the tendency for herd expansion is considerably less than the two mountain areas just discussed. The ratio of the sum of entries above the diagonal to the entries below the diagonal is only 1.0. The unusually high production increase in this area from 1959 to 1961 must be due largely to new producers in Yadkin and Surry counties. Many of these producers were formerly producers of manufacturing milk. The 1959-61 dropout rate was 14.8 percent.

Future Production Prospects

Intentions to expand averaged 26 percent, slightly higher than the state average. Surry and Yadkin counties were especially strong, with expected increases of 30 percent. It appears from stated intentions and past trends in expansion that considerable expansion can be expected in Yadkin, Surry and Stokes counties, but production will probably slow down in Person, Granville, Vance and Warren counties.

AREA IV - SOUTHERN COAST

Producer Characteristics

About 85 percent of the 194 producers in this area produce tobacco in addition to milk. The remaining 15 percent of the dairies tend to be specialized. Farm sizes average 117 acres of cropland and 48 acres of pasture. Herd sizes average 46 cows, considerably larger than the state average. Approximately 11.1 percent of the producers have herds with less than 20 cows and 22.0 percent have herds smaller than 30 cows, making this area the one with the smallest proportion of small herds. Average production per cow is 17 percent above the state average. The percentage of farms with mechanized feeding systems and pipeline milkers appears to be slightly higher than the state average.

Recent Trends

Production trends in counties around the Wilmington market have been strong. Production increases in Columbus, Pender, Bladen, Brunswick and New Hanover counties averaged 28.3 percent during 1959-1961. However, the counties farther from the Wilmington market--Robeson, Cumberland, Sampson, Duplin and Onslow--had a net average decrease in production of 5.8 percent. The decrease in number of producers in the entire area averaged 8.4 percent and the increase in production averaged 6 percent. Thus, the slightly greater than average producer dropout held production increases below state averages when the entire area is considered. Producer dropouts were about equally divided between

Table 7. Size changes of individual producers, Border Belt area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		99.8	0	0	0.1	0.1	0	0
1 - 4,999	22	22.7	27.3	50.0	0	0	0	0
5,000 - 9,999	103	19.4	4.9	41.7	20.4	11.7	1.0	1.0
10,000 - 14,999	91	11.0	0	11.0	36.3	38.5	3.3	0
15,000 - 24,999	103	12.6	0	1.9	18.4	43.8	23.3	0
25,000 - 49,999	49	16.3	0	0	2.0	8.2	65.3	8.2
Over 50,000	10	10.0	0	0	0	0	20.0	80.0

retirements, movement to nonfarm jobs and the production of other commodities. Tobacco, beef and other livestock enterprises appear to be common alternatives to Grade A dairying in this area. Table 8 indicates why the area seems to be lagging somewhat in production. The sum of entries to the right of the diagonal is only .6 of the total to the left. The high dropout rates in Column 1 (averaging 19 percent) and the low entry rates in row 1 account for much of this situation.

Future Production Prospects

Producers in Onslow, Pender, Craven, Jones, Columbus, Brunswick and New Hanover intend to expand herd sizes an average of 50 percent by 1964. Producers in other counties in this area have much more moderate expansion plans. In view of the large production increases in the counties around the coastal cities and stated intentions to expand, it appears that further expansion is likely. The outlying areas will probably decrease in production.

AREA V - SOUTHERN PIEDMONT

Producer Characteristics

There are 1,037 producers in this area, making it one of the most concentrated milk production areas in the state.1/ Average farm size is 129 acres of cropland and 58 acres of pasture. Average herd size is 39 cows. Only about 59 percent of the farms are specialized dairies. The remaining 41 percent operate wheat, beef, cotton and poultry enterprises in addition to milk. Approximately 10 percent of the producers have herd sizes of less than 20 cows and 38 percent have herd sizes under 30 cows. Average production per cow is about 7 percent below the state average.

Recent Trends

Production increases have averaged 12.7 percent during the period 1959-1961; slightly higher than the state average. Increases have been very uneven in this area, with strong increases in Rowan, Iredell and Stanly counties and weak trends elsewhere in the area. The net decrease in number of producers during the period 1959-1961 was 8.8, about the same as the state average. Dropouts were about

1/ Anson, Richmond and Moore counties were not included in this analysis.

Table 8. Size changes of individual producers, Southern Coast area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		99.9	0	0	0	0	0.1	0
1 - 4,999	6	33.3	33.3	33.4	0	0	0	0
5,000 - 9,999	32	28.1	12.5	31.3	21.9	3.1	3.1	0
10,000 - 14,999	34	11.8	5.9	14.7	32.3	29.4	5.9	0
15,000 - 24,999	60	18.3	0	1.7	11.7	45.0	23.3	0
25,000 - 49,999	64	17.2	0	1.6	0	7.8	64.0	9.4
Over 50,000	15	20.0	0	0	0	0	20.0	60.0

equally divided between retirements, movements to nonfarm jobs and change to the production of other commodities. Commodities which were adopted in place of milk were beef cattle, grain and general farming.

Table 9 indicates weaker tendencies for expansion than other areas and slightly higher rates of dropout. Dropout rates averaged 16 percent from 1959 to 1961.

Future Production Prospects

Intentions to expand herd size averaged 23 percent, slightly less than the state average. In view of the relative availability of nonfarm jobs in this area as well as other farming opportunities, prospects for further increases in production would probably be considered moderate. This area will probably increase at a slower rate than it has in the past and may become somewhat stable.

AREA VI - NORTHERN PIEDMONT

Producer Characteristics

Of the 930 farms in this area about 60 percent are specialized. Most of the rest operate tobacco enterprises in addition to dairy. Small grains are also common enterprises. Farms average 113 acres of cropland and 62 acres of pasture. Dairy herds average 38 cows, with 14.6 percent having fewer than 20 cows and 45.0 percent having fewer than 30 cows. Average production per cow is 7 percent higher than the state average.

Recent Trends

Production increases in this area during the period 1959-1961 were 8.3 percent, considerably smaller than the state average. Wake and Chatham counties had strong increases and hence were exceptions to the rest of the area. Forsyth and Davidson counties had decreases in production. Producer dropouts in this area as a whole were about equal to the state average, the very sharp decrease in producer numbers in Forsyth and Davidson counties being offset by relative strength in Alamance, Wake, Orange and Chatham counties. A smaller proportion of dropouts moved to nonfarm jobs than the state average, and a larger proportion changed to other commodities--mostly beef and small grains. Size changes for individual producers are summarized in Table 10. The coefficient of expansion in this area is .7, which when compared with the rest of the areas is quite low. The average dropout rate in the 1959-61 period was 16 percent.

Table 9. Size changes of individual producers, Southern Piedmont area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		98.8	0	0.2	0.2	0.4	0.3	0.1
1 - 4,999	55	40.0	20.0	32.8	3.6	3.6	0	0
5,000 - 9,999	191	21.5	4.7	36.6	30.4	6.8	0	0
10,000 - 14,999	285	14.7	0.4	13.3	34.7	33.0	3.9	0
15,000 - 24,999	364	12.3	0	1.6	9.6	51.9	24.2	0.3
25,000 - 49,999	186	11.3	0	0.5	1.6	7.0	62.9	16.7
Over 50,000	33	6.0	0	0	0	0	6.1	87.9

Table 10. Size changes of individual producers, Northern Piedmont area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		99.5	0	0.1	0.1	0.2	0.1	0
1 - 4,999	49	46.9	14.3	22.4	8.2	4.2	2.0	2.0
5,000 - 9,999	168	25.6	3.6	48.2	14.9	6.5	1.2	0
10,000 - 14,999	238	14.3	1.7	11.3	38.3	29.4	5.0	0
15,000 - 24,999	284	10.9	0	1.4	13.0	48.6	26.1	0
25,000 - 49,999	173	10.4	0	0	1.7	13.3	62.5	12.1
Over 50,000	47	12.8	0	0	0	0	14.9	72.3

Future Production Prospects

Producers' intentions to expand herd size averaged 21 percent, considerably lower than the state average. If present trends continue, it appears that production increases in this area should be very slow, with decreases occurring in the western part of this area.

AREA VII - CENTRAL COAST

Producer Characteristics

The 133 milk producers in this area have large, diversified farms and larger herds than average. Only about 20 percent of the dairies are specialized, the remaining 80 percent producing cotton, tobacco, peanuts, corn or beans in addition to milk. Many Grade A producers produce all of these commodities. Farm sizes average 185 acres of cropland and 59 acres of pasture. Herd sizes average 50 cows. The rather large average herd size is affected by the existence of a few very large herds. Approximately 6.5 percent of the herds have herds of less than 20 cows and 25.9 percent have herds less than 30 cows. Average production per cow is 13 percent higher than the state average. Farms were no more mechanized, on the average, than the producers in the rest of the state. The availability of farm labor for the other commodities produced on these farms may be adequate to operate the dairy enterprise without extensive mechanization.

Recent Trends

Production increases from 1959 to 1961 averaged 7.7 percent, considerably less than the state average. The various counties in the area were very diverse in their trends, with Northampton, Pitt, Green, Lenoir and Hyde counties showing strong increases and Nash, Edgecombe, Wilson and Wayne showing sharp decreases. Producer numbers increased in Pitt and Hyde counties and decreased in other counties.

Table 11 indicates the tendencies for producers in the various size categories to expand production. Herd expansions in the smaller categories appear rapid, but large herds are somewhat stable, holding down total production to moderate average increases. The dropout rate during the 1959-61 period was 17.6 percent.

Table 11. Size changes of individual producers, Central Coast area, 1959 to 1961

Production in September, 1959 (pounds)	Number of producers	Percentage of producers making specified change in September, 1961						
		Production (pounds)						
		Discontinued Grade A production	1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000
No Grade A production		100.0	0	0	0	0	0	0
1 - 4,999	4	25.0	0	50.0	25.0	0	0	0
5,000 - 9,999	20	25.0	0	25.0	20.0	30.0	0	0
10,000 - 14,999	22	27.3	0	9.1	27.3	31.8	4.5	0
15,000 - 24,999	30	13.3	0	6.7	3.3	50.0	26.7	0
25,000 - 49,999	32	9.4	0	0	0	15.6	59.4	15.6
Over 50,000	11	18.2	0	0	0	0	0	81.8

Future Production Prospects

Although future intentions to expand averaged about the same as the state average, milk production in this area probably will remain stable as producer dropouts offset increased herd sizes in remaining herds. Pitt, Beaufort and Hyde counties may increase rapidly to supply the New Bern milkshed.

PROJECTIONS

Without information on future blend prices, it is impossible to make convincing supply projections. However, if one is willing to assume that (1) prices will remain constant and (2) all other factors will continue to act in the future in much the same way as in the past, it is possible to extrapolate past trends to future years. The farther into the future the trends are extrapolated, the less confidence can be placed in the results.

Projections of Number of Producers

In this section the 1959 to 1961 size changes of the individual firms (including dropouts) are used to project total number of firms by market areas to 1963, 1965 and 1967. The two major components of information used in this projection are (1) the proportion of total farms in the various size categories in 1961 (i.e., the probability of a farm being in a specific size category), and (2) the proportion of farms in each size category in 1959 moving to each of the other size categories in 1961, (i.e., the probability of a farm which was in size category X in 1959 moving to size category Y in 1961). It is here assumed that the various probabilities remain constant for the period of projection--in this case until 1967.

Under these conditions the projections are extremely simple. The projected number of farms in size category 1-4,999 pounds in 1963 (which was unavailable at the time of this study) is equal to the following:

(1) The 1961 number of farms of size 1-4,999 multiplied by the probability of staying in this category until 1963, plus

(2) The number of farms of size 5,000-9,999 multiplied by the probability of moving from 5,000-9,999 to 1-4,999 by 1963, plus

(3) The number of farms of size 10,000-14,999 multiplied by the probability of moving from 10,000-14,999 to 1-4,999 by 1963, plus . . . . similar calculations for the other size categories.

Using the 1963 projections for the number of farms in each size category we can again multiply by the probability matrix and arrive at a projection for 1965. Then, using the 1965 projections for number of farms we can once more multiply by the probability matrix and obtain 1967 projections. This procedure can be repeated as often as desired, but the assumption that the probabilities remain constant gets more tenuous the farther into the future the projections are carried.

The results of this procedure for all areas are summarized in Table 12. Generally, the projections involve decreasing numbers of farms in the three or four smallest size categories and larger numbers of farms in the larger size categories. All regions except the two mountain areas exhibit decreasing total numbers of producers.

The number of firms in the 15,000-24,999 size category is decreasing in all areas except the two mountain areas. The projected total number of producers in the state involves decreases of about 10 percent in six years or 1.7 percent per year.

Projections of Total Milk Supplies

Projections of total milk supplies were obtained by multiplying the projections of the number of farms in each size class by the midpoint of the size class. These projections are given in Table 13. These projections involve increases over the 1961 figures as outlined in Table 14. Briefly the projections resulted in decreasing production in the Central Coast area, very slow increases (about 1/2 of 1 percent per year) in the Northern Piedmont, and fairly substantial increases in other areas. Through 1967, the state total would be expected to increase on the average of 4 percent per year. The largest increases are in the mountain areas as indicated in previous sections.

Some Reservations about the Projections

It is well to remember that in obtaining the projections, no consideration was given to direct production restrictions or to future prices. It was assumed that prices which prevailed during the period 1959-1961 would prevail. With this in mind, the basic procedures underlying the projections can be stated as follows: If the same conditions affecting Grade A milk production which prevailed during the period 1959-1961 continue in the same manner until 1967 and if producers react in much the same way to these conditions as they did during the period 1959-1961, the milk supplies can be projected to 1967 as indicated in Tables 13 and 14. These projections are based primarily upon growth patterns of individual firms. Given the type of data available, these

Table 12. Projections of number of producers in various size categories

Area	Year	Size categories						
		1 to 4,999	5,000 to 9,999	10,000 to 14,999	15,000 to 24,999	25,000 to 49,999	Over 50,000	Total
		(pounds)						
Northern Mountain	1961	23	118	104	110	32	1	388
	1963	5	81	117	119	63	2	387
	1965	2	60	112	125	86	5	390
	1967	1	49	103	127	104	8	392
Southern Mountain	1961	8	79	106	139	77	16	425
	1963	10	49	77	173	96	31	436
	1965	7	37	62	174	116	47	443
	1967	6	32	55	174	130	64	461
Border Belt	1961	18	91	89	95	46	16	355
	1963	9	58	69	110	79	18	343
	1965	5	39	59	108	104	21	336
	1967	3	27	51	103	119	26	327
Southern Coast	1961	4	30	26	59	64	14	197
	1963	6	16	22	41	88	14	187
	1965	5	13	16	32	97	17	180
	1967	4	10	12	27	101	19	173
Southern Piedmont	1961	34	172	264	348	184	35	1,037
	1963	16	130	196	321	233	69	965
	1965	10	99	157	285	258	108	917
	1967	7	80	131	253	265	146	882
Northern Piedmont	1961	31	148	219	283	189	60	930
	1963	13	122	164	269	229	67	864
	1965	9	100	136	243	249	76	813
	1967	7	84	120	231	255	85	782
Central Coast	1961	5	20	22	32	42	12	133
	1963	0	12	12	36	35	17	112
	1965	0	6	7	31	31	19	94
	1967	0	4	4	24	27	20	79
State total	1961	123	658	830	1,066	634	154	3,465[a]
	1963	59	468	657	1,069	823	218	3,295
	1965	31	354	549	998	941	293	3,166
	1967	28	286	476	939	1,001	368	3,098

[a]This figure is slightly smaller than the state total given in Table 4 because counties with negligible milk production were omitted from the analysis.

projections are probably as good as can be obtained by any method which consists of trend extrapolation. The trend extrapolation results in substantially the same conclusions as were obtained in the earlier descriptions of the various market areas. The consistency of the results obtained by these two methods lends added confidence in the results.

Probably the most valuable contribution of the projection analysis is to indicate the differing trends characteristic of the various market areas of the state. It is of considerable interest to note the characteristics of the producers in the various areas and relate these characteristics to the performance of the producers in terms of their tendency to expand or drop out of production. It would also be helpful to producers in the various areas to know how their characteristics relate to producers in other areas in the state.

Table 13. September supply projections by market areas

Market area	Production (1,000 pounds)			
	1961	1963	1965	1967
Northern Mountain	5,717	6,974	7,953	8,694
Southern Mountain	8,797	10,725	12,402	14,066
Border counties	6,657	7,824	8,667	9,307
Southern Coast	5,183	5,573	5,854	5,978
Southern Piedmont	21,143	23,764	26,114	28,079
Northern Piedmont	21,143	21,957	22,333	22,664
Central Coast	3,547	3,629	3,331	3,063
State total	72,187	80,446	86,654	91,851

Table 14. Projections of September production in future years as a percent of 1961

Market area	1963	1965	1967
Northern Mountain	122	139	152
Southern Mountain	122	141	160
Border counties	118	130	140
Southern Coast	108	113	115
Southern Piedmont	112	124	133
Northern Piedmont	104	106	107
Central Coast	102	94	86
State total	111	120	127

Appendix Table 1. Size distribution of producers by market areas, 1962[a]

Market area	Size class (number of cows in herd)					
	0 to 19	20 to 29	30 to 49	50 to 74	75 to 99	Over 100
Northern Mountain	29.8	40.8	25.4	2.6	1.3	0
Southern Mountain	14.5	33.0	32.6	14.1	1.8	4.0
Border counties	26.3	28.5	33.9	8.6	1.6	1.1
Southern Coast	12.8	12.8	39.4	28.2	3.4	3.4
Southern Piedmont	9.9	27.4	41.8	15.8	3.3	1.8
Northern Piedmont	15.7	29.6	34.6	13.6	3.9	2.6
Central Coast	6.8	16.2	43.2	17.6	8.1	8.1

[a]Source: Mail questionaire to producers in the spring of 1962.

Appendix Table 2. Number of producers, by counties, 1956, 1959, 1961[a]

County	Number of producers			Percent increase 1961 over 1959	Percent increase 1961 over 1956
	1956	1959	1961		
	(1)	(2)	(3)	(4)	(5)
Alamance	156	134	128	- 4.5	- 17.9
Alexander	65	87	84	- 3.4	+ 29.3
Alleghany	107	87	83	- 4.6	- 22.4
Anson[b]	3	27	26	- 3.7	b
Ashe	45	26	28	+ 7.7	- 37.8
Avery	12	4	4	0	- 66.7
Beaufort	15	17	16	- 5.9	+ 6.7
Bertie	1	2	2	0	+100.0
Bladen	22	18	17	- 5.6	- 22.7
Brunswick	7	9	7	- 22.2	0
Buncombe	164	138	137	- 0.7	- 16.5
Burke	32	22	24	+ 9.1	- 25.0
Cabarrus	83	75	64	- 14.7	- 22.9
Caldwell	48	42	39	- 7.1	- 18.8
Carteret	4	2	1	- 50.0	- 75.0
Caswell	28	24	22	- 8.3	- 21.4
Catawba	111	87	78	- 10.3	- 29.7
Chatham	126	90	86	- 4.4	- 31.7
Cherokee	35	19	15	- 21.1	- 57.1
Clay	53	36	35	- 2.8	- 34.0
Cleveland	125	104	94	- 9.6	- 24.8
Columbus	24	22	23	+ 4.5	- 4.2
Craven	24	21	20	- 4.8	- 16.7
Cumberland	39	38	29	- 23.7	- 25.6
Currituck	1	0	0	0	-100.0

Appendix Table 2 (continued)

County	Number of producers			Percent increase 1961 over 1959	Percent increase 1961 over 1956
	1956	1959	1961		
	(1)	(2)	(3)	(4)	(5)
Davidson	134	88	71	- 19.3	- 47.0
Davie	177	147	129	- 12.2	- 27.1
Duplin	16	11	10	- 9.1	- 37.5
Durham	25	19	20	+ 5.3	- 20.0
Edgecombe	18	15	15	0	- 16.7
Forsyth	95	117	97	- 17.1	+ 2.1
Franklin	6	5	4	- 20.0	- 33.3
Gaston	99	71	63	- 11.3	- 36.4
Gates	0	0	0	0	0
Graham	0	1	3	+200.0	0
Granville	63	49	50	+ 2.1	- 20.6
Greene	2	2	2	0	0
Guilford	123	108	107	- 0.9	- 13.0
Halifax	20	13	13	0	- 35.0
Harnett	9	9	9	0	0
Haywood	69	56	49	- 12.5	- 29.0
Henderson[b]	81	89	86	- 3.4	b
Hertford	2	0	0	0	-100.0
Hoke	5	4	2	- 50.0	- 60.0
Hyde	10	8	9	+ 12.5	- 10.0
Iredell	272	222	213	- 4.1	- 21.7
Jackson	10	5	2	- 60.0	- 80.0
Johnston	14	20	15	- 25.0	+ 7.1
Jones	6	4	3	- 25.0	- 50.0
Lee	10	5	5	0	- 50.0
Lenoir	8	12	10	- 16.7	+ 25.0
Lincoln	156	126	111	- 11.9	- 28.8
Macon	38	35	38	+ 8.6	0
Madison	41	46	37	- 19.6	- 9.8
Martin	8	4	4	0	- 50.0
McDowell	11	19	19	0	+ 72.7
Mecklenburg[b]	177	108	97	- 10.2	b
Mitchell	4	20	18	- 10.0	+350.0
Montgomery	11	14	13	- 7.1	+ 18.2
Moore	15	7	5	- 28.6	- 66.7
Nash	6	9	5	- 44.4	- 16.7
New Hanover	6	2	3	+ 50.0	- 50.0
Northampton	9	6	6	0	- 33.3
Onslow	9	6	5	- 16.7	- 44.4
Orange	131	84	77	- 8.3	- 41.2
Pamlico	9	6	7	+ 16.7	- 22.2
Pasquotank	2	0	0	0	-100.0
Pender	47	36	32	- 11.1	- 31.9
Perquimans	2	0	0	0	-100.0
Person	23	20	18	- 10.0	- 21.7
Pitt	12	14	16	+ 14.3	+ 33.3
Polk	16	11	11	0	- 31.2

Appendix Table 2 (continued)

County	Number of producers			Percent increase 1961 over 1959	Percent increase 1961 over 1956
	1956	1959	1961		
	(1)	(2)	(3)	(4)	(5)
Randolph	171	143	131	- 8.4	- 23.4
Richmond	1	1	0	-100.0	-100.0
Robeson[b]	22	22	18	- 18.2	b
Rockingham	88	67	58	- 13.4	- 34.1
Rowan	192	174	155	- 10.9	- 19.3
Rutherford[b]	53	42	39	- 7.1	b
Sampson	21	14	16	+ 14.3	- 23.8
Scotland[b]	6	9	7	- 22.2	b
Stanly	62	61	59	- 3.3	- 4.8
Stokes	14	20	15	- 25.0	+ 7.1
Surry	53	45	44	- 2.2	- 17.0
Swain	3	5	5	0	+ 66.7
Transylvania	20	15	15	0	- 25.0
Tyrrell	0	1	1	0	(100.0)
Union[b]	121	96	90	- 6.2	b
Vance	21	14	12	- 14.3	- 42.9
Wake	68	71	69	- 2.8	+ 1.5
Warren	39	27	25	- 7.4	- 35.9
Washington	0	3	3	0	(300.0)
Watauga	30	18	18	0	- 40.0
Wayne	37	42	37	- 11.9	0
Wilkes	41	23	25	+ 8.7	- 39.0
Wilson	6	6	4	- 33.3	- 23.3
Yadkin	110	102	107	+ 4.9	- 2.7
Yancey	43	51	46	- 9.8	+ 7.0
Total	4559	3857	3570	- 9.1	- 23.2

[a]Sources: Columns (1)-(3)--North Carolina Milk Commission producer base record cards; Column (4)--Column (3) divided by Column (2).

[b]Figures for these counties in 1956 are not comparable.

April, 1962

Dear Dairyman:

Please fill out this survey form and return it to us in the enclosed envelope. This information is necessary to complete studies of the cost of milk production now being conducted in cooperation with State College.

NORTH CAROLINA MILK COMMISSION
J. V. Whitaker
Executive Secretary

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Name of operator_____ Age_____ County_____.
(if different from above)

Number of cows milked this morning_____. Total pounds of milk sold in February of this year _____pounds.

Number of mature cows in herd_____. Of these, how many are Holsteins_____? How many Jerseys_____? How many Guernseys_____? Other breeds_____
_____.
(specify breed and number)

What is the largest number of mature cows that you could handle with your present facilities?_____

How many mature cows do you expect to have in your herd in 1964?_____.

List other crops and livestock from which you receive income;
_____,_____,_____,_____.

How much cropland do you farm _____(acres)? How much pasture_____(acres)?

Number of full-time men (counting yourself) working in your farming and dairy enterprises_____.

Answer the following questions by placing an "X" in the appropriate box. If none of the choices exactly describe your operation, choose the one which is most nearly correct. Feel free to write additional explanations in the margins or on the back of the page.

Do you raise ☐ all, ☐ most, ☐ a few, ☐ none, of your replacements?

Do you buy ☐ none, ☐ 1/4, ☐ 1/2, ☐ 3/4, ☐ all, of your feed grains?

Do you buy ☐ none, ☐ 1/4, ☐ 1/2, ☐ 3/4, ☐ all, of your hay?

Do you buy ☐ none, ☐ 1/4, ☐ 1/2, ☐ 3/4, ☐ all, of your silage?

Is your silage storage ☐ upright silo, ☐ horizontal silo, ☐ both?

Is your feeding system ☐ fully mechanized, ☐ partly mechanized, ☐ done by hand?

Do you have a ☐ pipeline milker, ☐ bucket type milker, ☐ milk by hand?

Type of central milking unit: ☐ stanchion barn with capacity of _____cows.

☐ milking parlor with capacity of _____cows.

☐ other (specify) _____

_____.

Do you have a part-time job off the farm? ☐ Yes,

☐ No.

Agricultural Experiment Station

North Carolina State

Raleigh, N. C.

R. L. Lovvorn, **Director of Research**

Bulletins of this station will be sent free to all citizens who request them.